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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/419,620	10/15/1999	JONG WOOK PARK	0465-0716P	1535

2292 7590 02/18/2004

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EXAMINER	
NGUYEN, DUNG T	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 02/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/419,620	JONG W. PARK	
	Examiner	Art Unit	
	Dung Nguyen	2871	

-- The MAILING DATE of this communication appears on the cover sh et with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 October 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,6,7,9-11,13-15 and 17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,6,7,9-11,13-15 and 17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Applicant's amendment dated 10/28/2003 has been received and entered.

By the amendment, claims 1, 6-7, 9-11, 13-15 and 17 are now pending in the application.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1 and 14 recites the limitation "the liquid crystal layer" in line 9. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1, 6-7, 9-11 and 14-15 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art (APA), in view of Applicant's submitted prior art, Katsuto, JP 5-323324, as stated in the previous office action.

APA discloses a method of forming a liquid crystal display (LCD) comprising the step of forming a LCD cell and heating the LCD cell (specification, page 3, lines 4-12). Furthermore, the heating step (t=100°C)(specification, page 3, line 8) is performed at the temperature that is less than a curing temperature of the sealant (t=180°C)(specification, page 8, line 4). It should be noted that the step of forming an alignment layer, sealant, laminating and injection a liquid crystal layer would be inherent to the step of forming the LCD cell.

APA fail to disclose the heating step being performed at a temperature is greater than about 10° C above a nematic isotropic transition temperature as well as the step of quickly cooling the LCD cell. Katsuto does disclose a LCD element is immediately plated flat on the surface of a rapid cooling plate to rapidly cool the LCD element from the heating temperature (see abstract). Therefore it would have been obvious to one skilled in the art to rapidly cool a APA's LCD cell from a heating temperature as shown by Katsuto in order to enable the efficient and easy reorientation of a liquid crystal layer (see purpose).

Regarding claims 6-7, 9 and 11, APA does not disclose the heating temperature and based material for the alignment layer. One of ordinary skill in the art would have realized the desire to form a polyimide based material or photo-alignment material (e.g., polysiloxane) for an alignment layer depending on the method of forming such alignment layer (i.e., rubbing or lighting). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to heat an LCD cell at a predetermine temperature as well as to use a polyimide based for the rubbing alignment layer and polysiloxance based material for the lighting alignment layer because it is a common practice in the art to perform a stable alignment layer in the LCD cell.

Φ. Claims 13 and 17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art (APA), in view of Applicant's submitted prior art, Katsuto, JP 5-323324, further in view of Mishina et al., US Patent No. 5,954,999, as stated in the final office action.

Regarding claims 13 and 17, the modification to APA disclose the claimed invention as described above except for the heating step is performed at a temperature which is substantially

equal to a baking temperature of the alignment layer. Mishina disclose a baking temperature of the alignment layer can be selected from -5° C to 100°C (col. 4, line 58). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to bake an alignment layer at 100° C as shown by Mishina, so as the heating temperature of the APA's LCD cell is substantially equal to a baking temperature of the alignment layer in order to product a liquid crystal alignment film which has a high tilt angle and excellent in electrical properties of LCD devices (see Technical Field).

Response to Arguments

5. Applicant's arguments filed 10/28/2003 have been fully considered but they are not persuasive as follows:

Applicant's arguments are as follow:

1. Applicant's related art (APA) does not teach or suggest "forming a liquid crystal cell", which further includes "heating the liquid crystal cell, wherein the heating step is performed at a temperature of about 100°C to about 170°C to form a uniform tilt angle of the alignment layer" as recited in claims 1 and 14 (amendment, page 7).
2. Katsuto does not teach or suggest that a heating step being performed at a temperature greater than about 10°C above a nematic isotropic transition temperature and the step of quickly cooling the LCD cell (paragraph bridging pages 7-8).
3. Applicant requests the Examiner to cite a reference which teach heating a liquid crystal cell at a temperature of about 100°C to about 170°C to form a uniform tilt angle of the alignment layer" as set forth in claims 1 and 14 (amendment, page 8).

4. Mishina et al. neither disclose "a baking temperature of the alignment layer" nor the above cited limitations of claims 1 and 14 (amendment, page 9).

The Examiner's respond are as follow:

1. The Examiner respectfully disagrees with Applicant's view point since APA does disclose a method of manufacturing an LCD apparatus comprising an LCD cell (see Dicussion of the Related Art, pages 2-3). In addition, such "LCD cell is heating ... at a temperature greater than Tni. ... the aging temperature is 100" (page 3, lines 6-8). Therefore, the limitation of "heating the liquid crystal cell, wherein the heating step is performed at a temperature of about 100°C ..." met.
2. As stated above, Katsuto does disclose an LCD cell is quickly cooling from the heating temperature (see abstract). It should be noted that the feature of "a heating step being performed at a temperature greater than about 10°C above a nematic isotropic transition temperature" is removed from claims. Therefore, such limitation has not been examined at least for this time.
3. APA reference does show a step of heating the LCD cell at a temperature of about 100°C (i.e., the aging temperature) (page 3, line 8) which is met the claimed invention.
4. The Examiner agrees that Mishina et al. disclose a reaction temperature for polymerizing the polyimide precursor; however, such polyimide precursor is a material film used to form an alignment layer (i.e., a film on a substrate). In other words, such the reaction temperature for polymerizing is also a baking temperature of the alignment layer. Therefore, the limitation of claims 13 and 17 met.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Mazaki et al. (US 5,460,748) disclose the heat treatment for an LCD being conducted at a temperature of 100°C to 260°C (see col. 49, lines 5-21).

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung Nguyen whose telephone number is 571-272-2297. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

DN
01/23/2004

Dung Nguyen
Patent Examiner
Art Unit 2871